PREFACE

Since 1984, The Federal Emergency Management Agency (FEMA) has had a comprehensive, closely coordinated program to develop a body of building practices that would increase the ability of existing buildings to withstand the forces of earthquakes. Societal implications and issues related to the use of these improved practices have also been examined. At a cost of about $16 million, two dozen publications and a number of software programs and audio-visual training materials have already been produced and distributed for use by design professionals, building regulatory personnel, educators, researchers and the general public. The program has proceeded along separate but parallel approaches in dealing with both private sector and Federal buildings.

Already available from FEMA to private sector practitioners and other interested parties is a "technical platform" of consensus criteria on how to deal with some of the major engineering aspects of seismic rehabilitation of buildings. This technical material is contained in a trilogy, with supporting documentation, completed in 1989: 1) a method for the rapid identification of buildings that might be hazardous in the event of an earthquake which can be conducted without gaining access to the buildings themselves; 2) a methodology for a more detailed evaluation of buildings that identifies structural flaws that have caused collapse in past earthquakes and might do so again in future earthquakes, and 3) a compendium of the most commonly used techniques of seismic rehabilitation.

In addition to these engineering topics, the program has also been concerned with the societal implications of seismic rehabilitation. In addition to the study Typical Costs for Seismic Rehabilitation of Existing Buildings, the FEMA program has developed benefit/cost models and associated software for application to both private sector and Federal buildings and identified for decision makers an array of socioeconomic issues that are likely to arise in a locality that undertakes seismic rehabilitation of its building stock. FEMA programs have also provided ways to array the building stock and the methods to analyze it.

The culminating activity in this field will be the completion in late 1997 of a comprehensive set of nationally applicable guidelines with commentary on how to rehabilitate buildings so that they will better withstand earthquakes. This is a multi-year, multi-million dollar effort that represents a first of its kind in the United States. The guidelines will allow practioners to choose design approaches consistent with different levels of seismic safety as required by geographic location, performance objective, type of building,

occupancy or other relevant considerations. Before being issued, the two documents will be given consensus review by representatives of a broad spectrum of users, including the construction industry, building regulatory organizations, building owners and occupant groups, academic and research institutions, financial establishments, local, State and Federal levels of government and the general public. This process is intended to ensure their national applicability and encourage widespread acceptance and use by practitioners. It is expected that, with time, this set of guidelines will be adapted or adopted by model building code organizations and standards-setting groups, and thus, will diffuse widely into the building practices of the United States. Significant corollary products of this activity are expected. Principal among them will be an engineering applications handbook with refined cost data; a plan for a structural transfer of the technology embodied in the guidelines; and an identification of the most urgent research and development needs.

In advance stages of preparation is a set of technical criteria intended to provide Federal agencies with minimum standards for both the seismic evaluation and the seismic rehabilitation of buildings in their inventories. The performance level established in the standards is life-safety for building occupants and the general public. To facilitate the application of the standards by users, a commentary has also been prepared. In addition, an Executive Order to promulgate the standards has been drafted. These materials were given consensus approval by the Interagency Committee on Seismic Safety in Construction, which represents 30 Federal Departments and Agencies, and were submitted to the Executive Office of the President for consideration in September 1994..

FEMA is pleased to have sponsored the development of these two new publications 2nd Edition: Typical Costs for Seismic Rehabilitation of Buildings - Volume 1 and 2nd Edition: Typical Costs for Seismic Rehabilitation of Buildings - Volume 2 : Supporting Documentation, for inclusion in the series of documents dealing with the seismic safety of existing buildings that is discussed above. In this endeavor, FEMA gratefully acknowledges the expertise and efforts of the Hart Consultant Group and its subcontractors, H. J. Degenkolb Associates, Engineers, Inc. and Rutherford & Chekene Consulting Engineers, the Advisory Panel for the project, and Ms. Diana Todd of the National Institute of Standards and Technology, the Technical Advisor to FEMA for this project.